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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/772,001	01/30/2001	Toshihiko Fujii	KOJIM-364	8476

7590

12/30/2002

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EXAMINER

SAGAR, KRIPA

ART UNIT

PAPER NUMBER

1756

DATE MAILED: 12/30/2002

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/772,001

Applicant(s)

FUJII ET AL.

Examiner

Kripa Sagar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 October 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Response to Amendment

1. The amendment filed on 10/8/02 has been entered.

Claims 1,4 have been amended. New claims 7-20 have been added. No new matter has been added.

Claims 1-20 are under consideration.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Pat. 5973044 to Lutz et al. in view of US Pat. 5668210 to Harris et al.

The invention is directed towards a surface treatment agent and a resist patterning process using the agent.

The claims disclose an organo-siloxane containing adhesion promoter or primer. The siloxane comprises a functionally substituted alkylene (R-sup-1), an alkyl radical (R-sup-2) a hydrolyzable group of alkoxy radical (OX) bonded to siloxane (SiO). The substituting functional group (Y) is chosen from amino, mercapto and isocyanate among others.

The primer is formed by the hydrolysis of a silane comprising the units R-sub-1, R-sub-2 as above and a hydrolyzable alkoxy group (OZ), bonded to Si.

The use of silane and siloxane containing polymeric compositions as adhesion promoters and primers is well known (Lutz 1;10-2;20). Lutz teaches its application in electronics (5;56-59). Lutz teaches an organosilane-containing adhesion promoter taught in prior art (8;5-13). The Compound CA-4 (3-glycidoxipropyltrimethoxy silane) is similar to the claimed material for the primer (claim-2) comprising the radicals (R-sup-1, R-sup-2, alkoxy and silane). The siloxane contains the radicals used in instant claims 8-15 (3;35-4;35). Lutz teaches that the material CA-4 did not perform well in the adhesion tests conducted (9;55-10;2). The improved adhesion of the same compound after reaction with alcohol and Lutz's inventive siloxane is discussed (10;3-60).

Lutz teaches the preparation of an organo-siloxane adhesion promoter and primer by reacting an alcohol, and organo-siloxane and a silane (2;35-67). It teaches the formation of siloxanes by hydrolysis of the reactive groups in the ingredients (5;31-51). Lutz teaches the specific silane as a starter. It teaches the hydrolysis of silanes to siloxanes. It teaches that siloxanes containing primers improve the adhesion of polymers.

Lutz does not teach the specific siloxane primer. Lutz does not teach the use of the primer to promote adhesion of photoresist to metal (or metal oxide) or the patterning of the resist (claims 4-6).

Harris teaches the formation of primers and adhesion promoting agents. The primer is used to bond another polymer to a substrate (4;67-5;2). A thin layer is coated (6;11-16). The substrates may be metals and metal oxides used in electronics (5;57-

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67). The overcoated polymer may be photosensitive and cured by radiation.

Alternatively, the primer may be mixed with the photoresist, applied and baked prior to exposure (6;11-31). Harris teaches the hydrolysis of organo-silanes in the presence of water to form the primer (6;40-8;9).

Harris does not specifically teach the patterning of photoresists. It is well known in the art that photoresists are applied in electronic manufacturing for patterning substrates and is admitted prior art by Applicant.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an organo-silane compound as a primer to increase the adhesion of photoresists to substrates as taught by Harris because it teaches that it is conventional in the art (1;19-50) and to form the compound by partial hydrolysis of a silane as taught by Lutz. Harris' examples further prove that there is a reasonable expectation of so improving the adhesion by using partially hydrolyzed silanes.

Response to Arguments

4. Applicant's arguments filed 10/8/02 have been fully considered but they are not persuasive.

Applicants have argued that: Lutz's composition is an adhesion promoting agent and not a "primer". The word primer does not appear in Lutz's teachings.

It is noted that the instant claims recite a "surface treatment agent" and no reference is made to a primer. Primers are well known in the art of lithography, as shown by the numerous references in Lutz's prior-art, as well as by Harris who teaches

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a primer that is coated on a surface to promote the adhesion of a polymer. It may be noted that Harris's primer also teaches the siloxanes of the instant invention.

Applicants have further argued that Lutz's method of hydrolyzing the silanes is different from that of the instant invention. In particular Lutz's reaction occurs in an anhydrous atmosphere, whereas the instant invention teaches hydrolysis in the presence of water.

This argument is unconvincing. Claim 2 merely recites hydrolysis of a silane and the use of water is not claimed. Lutz teaches hydrolyzing an organo-siloxane and a silane in a dry atmosphere. **Excess reaction products** are removed to maintain equilibrium and prevent the reverse reaction (5;35-40) as any prudent chemist would do. To characterize this as a different reaction is unpersuasive. Harris teaches hydrolyzing an alkoxysilane in the presence of water. Further the specification suggests that hydrolysis may be carried out by a *conventional* process (p.3;l-22-23) – indicating that the process is non-critical.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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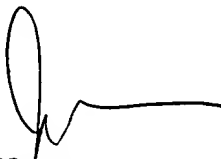
mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kripa Sagar whose telephone number is 703-605-4427. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.

MH/ks
December 23, 2002



JOHN A. MCPHERSON
PRIMARY EXAMINER